

Supporting Documentation for the Fire Behavior Module (IFT-FlamMap)

Name of Software Tool: Fire behavior (IFT-FlamMap)

Current Version Description/Date: Version 3.0.0. March 20, 2006

Software Code and History: The software code for the FlamMap surface fire behavior module (.dll file format) was acquired from the Missoula Fire Sciences Laboratory via a private contractor in 2009.

Software Developer(s) Names, Organization, and Contact Information: U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program.

Note to Users: For questions specifically relating to the internal functional operations of this module, contact the developer(s) or help desk resources for this software tool. For questions regarding how this tool is used within IFTDSS, please contact the IFTDSS Team using the Feedback function available on every page of IFTDSS.

Science Model Contact, Names, Organization, and Contact Information: U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program; Mark Finney.

Help desk contact information:

- Phone: 866-224-7677 or 360-326-6002
- Email: fire_help@fs.fed.us
- Website: <http://www.fs.fed.us/fire/planning/nist>

Availability of the Version of Record: The latest version of the software code for this surface fire behavior module resides with the U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program.

Primary Funding Sources: Joint Fire Science Program (JFSP); U.S. Department of Interior Bureau of Land Management (BLM); U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program; and U.S. Forest Service, Rocky Mountain Research Station, Wildland Fire Research Development and Applications.

Application Purpose (General): The fire behavior module (IFT-FlamMap) is a spatial fire behavior tool in which an entire landscape is analyzed using a single set of wind and moisture conditions. The module creates raster maps of potential fire behavior characteristics (e.g., rate of spread, flame length, crown fire activity) and environmental conditions (e.g., dead fuel moistures, midflame wind speed, solar irradiance) and minor and major travel paths over a landscape. There is no temporal component in this module. The module uses spatial information on topography and fuels to calculate fire behavior characteristics for the selected wind and moisture conditions. For more information, see

<http://www.firemodels.org/index.php/flammap-introduction/flammap-publications#Guides> for Spatial Fire Behavior Analysis.

Application Purpose (Fuel Treatment): Fire behavior is used in IFTDSS to help identify areas of the landscape where expected fire behavior and certain fire effects are potentially within or outside of acceptable levels. The information provided by the module indicates where fuel treatments may be warranted. The module can be run for a single point location (stand) or across a larger area using a landscape (.lcp) file. For more information, see <http://www.firemodels.org/index.php/flammap-introduction/flammap-publications#Fuel Treatment Location Simulations>.

User/Application Documentation:

- <http://www.firemodels.org/index.php/national-systems/flammap>
- <http://www.firemodels.org/index.php/flammap-introduction/flammap-publications>

User Application Guidance: Can be found at <http://www.firemodels.org/index.php/flammap-introduction>.

- Finney, Mark A. 2006. An overview of FlamMap fire modeling capabilities. In: Andrews, Patricia L.; Butler, Bret W.; comps. Fuels Management – How to measure success: Conference Proceedings. 28-30 March 2006; Portland, OR. Proceedings RMRS-P-41, Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 213-220. (http://www.fs.fed.us/rm/pubs/rmrs_p041/rmrs_p041_213_220.pdf)

Scientific Foundations of the Software Tool:

- Degree of validation/evaluation and availability of written results:
 - No information available at this time.
- Publication history:
 - Peer-reviewed publications
 - Finney, M. A. 2007. A computational method for optimising fuel treatment locations. *International Journal of Wildland Fire* 16: 702-711.
 - Stratton, R. D. 2004. Assessing the effectiveness of landscape fuel treatments on fire growth and behavior. *Journal of Forestry* 102(7): 32-40. (http://www.landinfo.org/ecosystem_defense/federal_agencies/forest_service/Region_1/Idaho_Panhandle_NF/Bonnars_Ferry_District/Myrtle%20HFRA/Myrtle%20Creek%20HFRA%20Objection%20references%20disk%204/stratton2004treatments.pdf)

- Ager, A. A.; Finney, M. A.; Kems, B. K.; Maffei, H. 2007. Modeling wildfire risk to northern spotted owl (*Strix occidentalis caurina*) habitat in Central Oregon, USA. *Forest Ecology and Management* 246: 45-56.
- Finney, M. A. 2001. Design of regular landscape level fuel treatment patterns for modifying fire growth and behavior. *Forest Science* 47(2): 219-228.
- Non-peer-reviewed publications
 - Stratton, R. D. 2006. Guidance on spatial wildland fire analysis: models, tools, and techniques. General Technical Report RMRS-GTR-183. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
 - Finney, M. A.; Seli, R. C.; McHugh, C. W.; Ager, A. A.; Bahro, B.; Agee, J. K. 2007. Simulation of long-term landscape-level fuel treatment effects on large wildfires. *International Journal of Wildland Fire* 16: 712-727.

Training Availability: Can be found at <http://www.firemodels.org/index.php/flammap-support/flammap-training>.